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**A COMPARISON OF THE MILITARY AND CIVILIAN
HEALTH SYSTEMS**

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A Comparison of the Military and Civilian Health Systems

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This paper is based on a study, "Health Services in the All Volunteer Armed Forces" prepared for the President's Commission on an All Volunteer Armed Force (The Gates Commission). I wish to thank my colleagues at the Center for Naval Analyses and on the staff of the President's Commission for their advice and comments on the study. In particular I am greatly indebted to Mr. Robert Epley for his conscientious efforts to estimate the costs of health services and to Dean William Meckling, Executive Director of the Commission, for his incisive criticism. The Office of the Deputy Assistant Secretary of Defense for Health Affairs was extremely helpful in providing me with data and guidance.

Abstract

This paper compares the civilian health system in the U.S. to the military's prepaid (at zero price) hospital based group practice system. The military system is found to have higher per capita costs and to use a higher ratio of health personnel to the population. Morbidity data indicates that male civilians are in poorer health than armed forces personnel. Despite lower morbidity rates, hospital utilization is much higher in the military sector. It is suggested that the military could decrease their expenditures on health by reducing hospital utilization.

A Comparison of the Military and Civilian Health Systems

I. Introduction

The daily press, magazines and learned journals are continually discussing the crisis in the American health system.^{1/} Our health system is a patch quilt of free enterprise, philanthropy and government subsidy. Most observers tend to forget that coexisting with this patch quilt is an independent "socialist" health system providing medical services to an estimated ten million Americans. This "socialist" system is the health services system of the Department of Defense (DOD) which furnishes medical care to active duty and retired personnel and their dependents.

The Department of Defense provides free medical and dental services to all active duty personnel. Free medical and dental services are also available to retired personnel on a space available basis. Dependents receive medical services at no cost on a space available basis, but are ineligible for dental services unless domiciled overseas or in domestic areas certified to have a shortage of civilian dentists.

How well does this military system, which essentially is a prepaid (in this case free) hospital based group practice perform relative to the civilian sector? This study compares the costs of the Defense Department system to those prevailing in the civilian sector, and finds higher costs in the military sector. Morbidity rates for both sectors are compared and found lower for the military sector. This may be the result of the military devoting more resources to health care, but the available data precludes one from concluding that this is so.

II. Resources

The Department of Defense budgeted an estimated 2 billion dollars in Fiscal Year (FY) 1970 to provide health services to a population of approximately 10 million active duty personnel, retired personnel and dependents. Tables I and II contain the relevant data on facilities, manpower, expenditures and the eligible population.^{2/}

Preliminary cost work done at CNA indicates that the budgetary expenditures for medical care are not \$2b, but rather approximately \$3.2b. The difference is mainly a

result of the way the armed forces budgeting system operates. The \$2b estimate is for expenditures under Program VIII -- Training, Medical, and Other General Personnel Activities. However, health service expenditures are frequently charged, for valid reasons, to programs other than Program VIII. For example, base dispensaries and frequently base hospitals may be charged to the bases budget rather than the medical budget. Other differences arise as a result of differing costing methodologies, particularly in regard to fringe benefits and pensions.

It must, however, be borne in mind that even the \$3.25b figure represents expenditures rather than the true factor costs. As a result of the draft, the price of manpower to the Armed Forces is much below the true factor cost. Using the true factor costs involved in providing health services would probably raise the figure to approximately \$4b.

TABLE I

DEPARTMENT OF DEFENSE
MEDICAL SERVICES

FACILITIES:

HOSPITALS	242
DISPENSARIES, LARGE REPORTING	Over 450
PLUS LABORATORIES, DENTAL CLINICS AND OTHER ACTIVITIES	

MANPOWER:

MEDICAL CORPS	15,972
DENTAL CORPS	6,717
NURSE CORPS	11,321
MEDICAL SERVICE CORPS	9,397
BIOMEDICAL SCIENCE CORPS	1,043
ARMY MEDICAL SPECIALIST	613
VETERINARY CORPS	1,040
ENLISTED	109,027
CIVIL SERVICE*	<u>47,665</u>
TOTAL	202,795

<u>EXPENDITURES (FY'70 EST.):</u>	<u>(IN MILLIONS)</u>
HEALTH RESEARCH	104.3
TRAINING AND EDUCATION	132.3
CONSTRUCTION	63.0
DIRECT HOSPITAL & MEDICAL SERVICES	1,476.8
INDIRECT HOSPITAL & MEDICAL SERVICES	209.8
PREVENTION - CONTROL OF HEALTH PROBLEMS	<u>21.5</u>
TOTAL	<u>2,007.7</u>

Note: *includes U.S. and Foreign Hires, direct and indirect for Army.

Manpower as of 31 Dec 68

Source: Office of the Deputy Assistant Secretary of Defense for Health Affairs

TABLE II

POPULATION ELIGIBLE FOR CARE IN
ARMED SERVICES MEDICAL FACILITIES
31 DECEMBER 1968

3.4 Million Active Duty Personnel

4.1 Million Dependents of Active Duty Personnel

2.5 Million Retired, Dependents of Retired and Dependents
of Deceased Members

.025 to .035 Million Civilians Overseas and their Dependents

10,025,000 to 10,035,000

Source: same as table I

In addition to expenditures by DOD, the recipient population also has out of pocket costs for health services. These are for dental services and the co-insurance provisions of the Civilian Health and Medical Programs of the Uniformed Services (CHAMPUS).^{3/} In CY 1968 private per capita expenditures on dental care in the U.S. was \$16.53.^{4/} If we assume that approximately half the recipient population receive dental care outside DOD facilities then we can estimate a per capita cost of \$8.27 and a total cost of \$82.7 million. Another estimate is the figure of \$220-240 million calculated by ODASD (HA) for the annual cost of a civilian dental care program similar to the CHAMPUS medical care program.

No data is available on the cost of the co-insurance feature of the CHAMPUS program, but preliminary estimates indicate that this was about \$26 m or \$2.60 per capita in FY 1969. Adding our estimate of \$3.25b for DOD expenditures to the estimate for dental care and co-insurance costs yields an estimated per capita annual expenditures of \$335-350 which is greater than the figure of \$294 per capita for the total U.S. population in FY 1969.^{5/} The gap increases if we use the estimate for true factor costs in place of the budgetary expenditures.

The data on per capita expenditures is difficult to interpret until more is known about the relative quality of medical care in the armed forces and the civilian sector. In addition, military costs are inflated by the war in Vietnam.

The Defense Department employs 34,000 physicians, dentists and nurses. These represent about 22% of the total military health personnel and about 17% of the total manpower devoted by DOD to health services. There are 470 physicians and 198 dentists per 100,000 active duty personnel. For the entire population served by the Defense Department the physician rate is 160 per 100,000.^{6/} For the entire U.S. population there were 151 active doctors per 100,000 persons in CY 1967.^{7/}

There were 67 dentists per 100,000 members of the Defense Department population. Since at least a third of the population is ineligible for dental care, and others, particularly retired personnel, do not avail themselves of the services, the true ratio is probably over 100 dentists per 100,000. Both these ratios are significantly above the national figure of 56 per 100,000.^{8/}

Another way of contrasting the relative distribution of health personnel between the two sectors is to divide the total population being serviced by the total number of persons rendering health services, including in the latter group para-professionals, orderlies, secretaries, etc. For the DOD population this ratio is approximately 49.4 recipients per provider. If the civilian sector in 1967 the commensurate ratio was 58.0 recipients per provider.^{9/}

In summary, all the indexes used in this section indicate that the military sector devotes more resources per capita to health care than does the civilian sector. Or stated differently the "socialist" DOD system is more expensive than the civilian system.

III. Morbidity^{10/}

The previous section discussed at some length the inputs to the production of health services. In this section an attempt will be made to get some indicators of the output of health services. Various indexes will be used to contrast health status in the military and civilian sectors. Unfortunately, the data collected is often not directly comparable.

Table III shows that there are significant differences between the Air Force and Army morbidity rates. Unfortunately, comparable data is unavailable for the Navy except in the case of hospitalization ratios. Admissions to hospitals and quarters -- i.e., being excused from duty for medical reasons -- is more common in the Army. The Army admissions ratio was about 50% above that for the Air Force in the 1961-1963 period. Both services had a decreasing rate after 1959. The Air Force rate seems to have leveled off at approximately 180 per 1,000 during the past few years. The Army rate dropped by 24% between 1959 and 1964, but has been increasing since. The increase in the last two years was undoubtedly due to the war in Vietnam; either because of decreasing draft medical standards or an increasing proportion of men stationed in Southeast Asia with concomitantly high non-battle morbidity rates.

On the average it appears that episodes of illness were more frequent but less serious in the Army than the Air Force. Thus, days lost per admission has consistently been higher in the Air Force. However, the discrepancy in

TABLE III

SELECTED INDEXES OF MORBIDITY IN THE ARMED FORCES 1959-1967¹

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
	A. Admission Rates per 1,000								
Army ²	355	345	309	300	291	271	279	340	331
Air Force ³	246	237	208	202	195	186	179	180	177
	B. Days Lost per Admission								
Army ²	12.2	12.5	13.3	13.4	12.8	12.7	12.7	12.7	13.1
Air Force ³	13.7	13.7	13.6	13.5	13.5	13.7	14.3	14.6	14.9
	C. Noneffective Ratios per 1,000 average strength								
Army ²	11.9	11.8	11.3	11.0	10.2	9.4	9.7	11.8	11.9
Air Force ³	9.3	8.9	7.7	7.5	7.2	7.0	7.0	7.2	7.2
	D. Hospitalization Ratio per 1,000 average strength								
Army ^{2,4}	9.4	8.7	8.6	8.2	7.7	7.1	6.8	8.0	8.1
Air Force ³	7.2	6.8	6.0	5.8	5.6	5.4	5.5	5.5	5.3
Navy and Marine ^{5,6}									
Corps	9.4				7.9	7.4	7.2	7.7	8.6

TABLE III - (cont.)

1. All data refers to calendar year unless otherwise specified.
2. Excludes battle injuries.
3. Includes very small number of battle injuries.
4. For fiscal year.
5. Includes battle injuries.
6. Navy data is for Calendar year until 1963 and Fiscal year thereafter.

Definitions:

Admission rate is total number of spells of illness per 1,000 per year.

The admission rate multiplied by the days lost gives total sick days per 1,000 per year.

This product divided by 365 gives the non-effective ratio, i.e., number of men per 1,000 ill on any given day.

The hospitalization ratio is the number of men per 1,000 in the hospital on any given day.

Sources:

Army data from Annual Chart Book: Army Medical Department, Department of the Army, Office of the Surgeon General, Office of the Comptroller, 1970.

Air Force data from various Annual Reports of the USAF Medical Service Office of the Surgeon General, United States Air Force.

Navy data from Medical Statistics: U.S. Navy volumes 95-99 and Statistics of Navy Medicine volumes 20-25, Office of the Surgeon General U.S. Navy.

admission rates is of greater relative importance than the decrease in days lost per admission. Hence, the non-effective rate for the Air Force is much smaller than it is in the Army. Non-effective rates for both services have dropped since 1959. The Air Force rate appears to have leveled off at approximately 7.0 - 7.2 per thousand, while the Army rate has been increasing since 1964 and in 1967 it equaled the 1959 rate.

The Air Force hospitalization rate is lower than the rate for the other services. The Navy-Marine Corps data includes battle injuries, but excludes Naval station hospitals and thus, isn't comparable to the data for the other services.

Some a priori reasons can be given for the apparent better health of the Air Force. The Air Force applies much more stringent medical standards to its applicants and thus, has a healthier population to begin with. The Air Force has a higher proportion of officers.^{11/} This should reduce illness since a smaller proportion of Air Force personnel live in barracks where contagious diseases, particularly

upper respiratory infections, spread rapidly. Uniformed personnel in the Air Force have a higher level of educational attainment than their Army counterparts, and recent studies indicate that education is positively correlated with health.^{12/} On the other hand, Air Force personnel are older which should lead to increasing disability. The causes listed above are meant to be suggestive rather than conclusive. This is an area which warrants further investigation.

Table IV compares sick days in the military to sick days in the civilian sector. For the civilian sector two measures are used. The one which would appear to be closest to the military definition is work loss days, but this is an understatement since the military data refers to a seven day week rather than a five day week. Another measure of illness in the civilian sector is restricted activity days which may include days in which one may have worked, but was limited in his activity.

It should be noted that, unlike the other tables, the Army data in table IV contains battle casualties. Initial

calculations indicate that in the absence of battle casualties, but including non-battle data from Southeast Asia, the average sick days per person per year for the Army was 4.0 in 1966 and 3.2 in 1967.^{13/}

Irrespective of the civilian measure, morbidity in the armed forces is lower than in the civilian sector. Reasons for this include the more select population in the armed forces and the availability of free medical care in the military. Another factor leading to lower morbidity in the armed forces may be the requirement of an examination by a corpsman or doctor before one can be excused from duty.

Despite higher morbidity rates in the civilian sector, hospital utilization is much higher in the military sector. Table V shows that, relative to the civilian population, a higher proportion of military men enter the hospital, and once there, they stay for a longer period. Thus we face the paradox that the healthier population is also the one with greater consumption of hospital resources.

Economic discussions of the civilian health sector have advocated increasing efficiency by reducing hospital

TABLE IV
AVERAGE SICK DAYS PER PERSON PER YEAR

	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Army ^{1,4}	3.7	3.5	3.7	4.9	5.4
Air Force ^{1,4}	2.6	2.6	2.6	2.6	2.6
Male Civilian ²					
(a) work loss days	4.0	4.0	4.7	3.9	3.9 ³ (4.2)
(b) restricted activity days	9.0	9.8	9.0	10.0	9.8

1. Army and Air Force data is for the calendar year.
2. Civilian data is for the fiscal year. All civilian data is standardized to the age distribution in the armed forces for the year.
3. Data in parenthesis is for calendar year 1967.
4. Army and Air Force data include battle casualties.

Sources:

Army data from table prepared by the Medical Statistics Agency, Office of the Surgeon General, Department of the Army.

Air Force data is in table III.

Civilian data from Current Estimates from the Health Interview Sur, Series 10 No. 10, 13, 20, 37, 43, and 52.

National Center for Health Statistics, Department of Health, Education and Welfare.

TABLE V
SELECTED INDEXES OF HOSPITAL USAGE

	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
A. Hospital Days per Hospital Admission ⁴					
Army ^{1,2}	14.7	13.7	13.6	12.4	13.3
Air Force ³	10.7	11.0	11.7	11.6	11.4
Civilian Males ¹	11.1	9.3	8.1	8.6	9.2
B. Hospital Admissions per 100 Persons Per Year ⁴					
Army ^{1,2}	29.8	27.4	27.0	31.9	32.9
Civilian Males ¹	8.4	8.0	8.2	8.7	8.2

1. Data refers to fiscal year.
2. Army data includes battle casualties in Part A excludes then in Part B.
3. Air Force data refers to uniformed personnel in all services treated in Air Force medical facilities and may include some battle casualties.
4. For civilians, data is hospital discharges. This probably leads to an understatement of the true civilian figures.

Sources: same as previous tables.

usage and substituting ambulatory care.^{14/} By these standards, the military medical system appears inefficient. However, it is argued that for a large proportion of the active duty personnel, hospital usage is warranted since they can't remain unattended in the barracks. In other words, for many illnesses, particularly upper respiratory infections, a civilian can remain at home tended by his family, but a soldier, whose only home is the barracks, must go to the hospital.

If this viewpoint is correct, then it is difficult to understand why hospital days per admission are so much higher in the armed forces. It would appear that the hospital stay for those illnesses which do not require hospitalization in the civilian sector, should be shorter, on the average, than the stay for other, more severe illnesses. Thus, the higher hospital utilization rate in the military still requires explanation.

In fiscal year 1969 cost per patient day in Army hospitals was only 57% of the costs in non-federal short term general hospitals.^{15/} If, indeed, many Army patients

require mainly hotel services and only a minimal amount of medical services this may explain the relatively low cost per patient day. This in turn seems to indicate that it might be advisable for the armed forces to invest in small infirmaries where moderately ill patients could receive the hotel care they need. These infirmaries could rely on medical corpsmen to dispense whatever medication is required.

In summary, this section indicates that military personnel are in better health than their civilian compatriots. There is no way of determining to what extent this is due to starting out with a healthier population and to what extent it is due to the greater per capita expenditure discussed earlier. In addition, we noted that military medical care is much more hospital intensive than in the civilian economy. To re-emphasize this point; in the Air Force in 1967, 74% of all those excused from duty were hospitalized whereas in the civilian economy, hospital days for males 17-64 were only 26% of their work loss days.

FOOTNOTES

1. For examples of recent discussions of the cost and quality of medical care in the civilian sector see: Fred Anderson, "The Growing Pains of Medical Care", a three part essay in The New Republic beginning January 17, 1970, and Fortune Magazine, January, 1970 for an editorial and four articles on "Our Ailing Medical System".
2. Unless otherwise stated all data in this section was provided by the Office of the Deputy Assistant, Secretary of Defense for Health Affairs and refers to December 31, 1968.
3. The CHAMPUS program is discussed in detail in: Frank van Dyke, Military Medicare, Columbia University School of Public Health, June 1969.
4. Dorothy P. Rice and Barbara S. Cooper, "National Health Expenditures, 1929-68", Social Security Bulletin, January, 1970, table 7.
5. Ibid, table 1.
6. The ratio for the military population is underestimated since dependents and retired personnel have the CHAMPUS option.
7. Taken from p. 16 of Health Manpower: U.S., 1915-1967, National Center for Health Statistics, Nov. 1968. Their figure of 158 was reduced to account for 14,198 inactive physicians.
8. Ibid, p. 31.
9. For the civilian sector assumed 3,410,600 persons employed in health fields (upper estimate from Health Manpower, op. cit., p. 4) and total resident population of 197,854,000 as per table 2, Statistical Abstract of the U.S., 1969, U.S. Bureau of the Census.

10. I am indebted to Mrs. Linda Miller and Mrs. Karen Shipper for some of the calculations in this section.
11. On June 30, 1967, 15.1% of Air Force personnel were officers. The comparable proportion for the Army was 9.9%. Selected Manpower Statistics, April 15, 1968.
12. Data on accessions for October 1966-September 1968 indicate that 97% of Air Force accessions were high school graduates as compared to 72% for the Army. School grades completed were 11.8 for the Army and 12.5 for the Air Force. Project One Hundred Thousand, Office of the Assistant Secretary of Defense (Manpower and Reserve Officers), March 1969. For the effect of education on health see Michael Grossman, The Demand for Health unpublished Ph.D. dissertation, Columbia University, 1969.
13. Annual Chart Book, op. cit.
14. See, for example, Report of the National Advisory Commission on Health Manpower, Nov. 1967, Washington, G.P.O. Vol. II Appendix IV, which argues that much of the increased efficiency of the Kaiser Foundation Medical Care Program is due to this type of substitution.
15. Annual Chart Book, op. cit.

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